

MARINE BATTERY TRAINING GUIDE

How to Select, Install and Maintain
a Marine Battery



EXIDE® MARINE BATTERIES



Understanding Battery Ratings

EXIDE rates batteries using standard BCI (Battery Council International) industry ratings. These ratings are designed to help you select the proper battery for your application. In order to determine which battery is right for a specific application, you should understand the following ratings.

Ampere Hour Rating (Reference Rating)

This is the number of amps which a battery can deliver for a 20-hour period. This test is also referred to as the 20-hour rate. The larger the ampere hour rating, the more power the battery can deliver over time.

Marine Cranking Amps (MCA)

This is the number of amps a battery can deliver at 32 degrees fahrenheit for 30 seconds, and maintain at least a voltage of 1.2 volts per cell. This differs from cold cranking amps which are measured at 0 degrees fahrenheit.

Reserve Capacity (RC)

This is the time, in minutes, for which a battery will deliver 25 amperes at 80 degrees fahrenheit. This represents the time which the battery will continue to operate essential accessories in the event of alternator or generator failure or while the key is off.

Determining The Ampere Hour Draw Of Your Boat

In order to determine the ampere hour draw of your vessel, you need to know what electrical equipment you have and what the 12-volt amp draw is. The following is a listing of typical 12-volt equipment aboard most boats and the average amp draw per hour.

12-VOLT ITEM	AMP DRAW
Bilge Pump (500 gph)	2.0
Bilge Pump (1000 gph)	2.9
Bilge Pump (1500 gph)	4.9
Bilge Pump (2000 gph)	8.4
Navigation Lights (3 mile)	1.5
Live Well Pump	7.0
Fresh Water Pump	4.0
Refrigerator (12 volt)	6.0
Ice Maker	6.0
Macerator	9.0
Anchor Windlass (900 lb)	75
12 Volt House Lighting	0.15 per 10 watts
Spot Lights (100K cp)	8.0
Spreader Lights (3K cp)	3.0
RADAR (24 mile)	5.0
GPS	0.8
LORAN	0.7
VHF Radio - transmit	6.0
VHF Radio - receive	0.5
Fish Finder (LCD)	1.0
Depth Finder (Color)	3.0
SSB - transmit	30
INVERTERS*	
SSB - receive	2.5
Autopilot	5.0
Stereo (50 watt)	0.5
Fan	1.0
TROLLING MOTORS (12 volt)	
24 lb thrust	27
30 lb thrust	30
36 lb thrust	36
42 lb thrust	40
55 lb thrust	55

*Inverters vary on 12-volt amp draw depending on 115 volts A/C draw. Please consult your inverter manufacturer for additional information.

Additionally, the above amp draw is for “on time” while the batteries are being used. Remember, a refrigerator, fresh water pump, macerator, etc. only draw power intermittently.

Calculate the AMP Hour Capacity Battery you Need

In order to determine the proper amp hour rating capacity you need for your boat, simply add up the 12-volt accessories you have, multiply by 20; that should give you a very good approximation of your boat's amp hour battery requirement. Then cross reference this to the charts below. The first chart provides amp load versus minutes, the second chart provides the 20-hour rate. It is usually advised to buy a battery at least 20% over this requirement, as 12-volt capacity varies with usage and as batteries age.

AMP Load VS. Minutes

MODEL #	DISCHARGE TIME IN MINUTES					
FP-AGM24DP	870	420	270	192	145	38
FP-AGM24MS	690	325	209	153	120	36
24MDP	790	350	215	156	120	33
24MDC	920	410	254	180	140	38
27MDP	1200	500	300	211	160	40
27MDC	1270	545	335	235	182	47
31MDC	1410	615	380	270	205	54
4DMDC	2290	880	505	335	250	65
8DMDC	2700	1200	735	522	400	105
	5	10	15	20	25	75

Load In AMPs

20 HOUR RATE

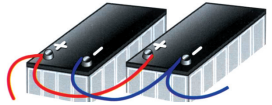
MODEL #	AMP HOUR @ 20-HR. RATE
FP-AGM24DP	75
FP-AGM24MS	60
24MDP	70
24MDC	80
27MDP	100
27MDC	105
31MDC	115
4DMDC	160
8DMDC	200

Series Versus Parallel Installations

Batteries can be arranged differently to achieve increased capacity or increased voltage to match your specific requirements. **It is extremely important not to mix battery types (Flooded, AGM).**

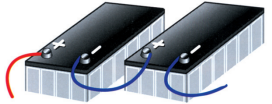
Parallel Installation

Two batteries connected + to + and - to - in a parallel system that increases capacity and maintains a specific voltage. This configuration doubles the power or amp hour rating of the battery while maintaining the voltage. Thus, two 25-amp hour, 12-volt batteries in parallel will give you a 50-amp hour 12-volt system.



Series Installation

A series system increases the voltage and keeps the battery capacity the same. The same two batteries in a series arrangement will increase the voltage to 24 volts and maintain a battery capacity of 25 amp hours. To install batteries in series, one battery's positive post is connected to the second battery's negative post.



Installation and Maintenance

Exide batteries should always be installed in a ventilated area. Batteries release explosive gasses during the charging phase and should not be exposed to spark or flame. When installing a battery in your boat, it is important to use either a box or a tie-down system to keep the battery stationary once underway. This will reduce unnecessary vibration. Make sure all connections to the battery terminals are tight. Additionally, it is important to coat the terminals and connections with a corrosion inhibitor (not needed on AGM batteries). The corrosion inhibitor should be reapplied every several months. Failure to do this will result in poor connections and wire corrosion, especially in salt water environments. Corrosion increases the resistance in the wires, requiring more amps to be drawn to run electrical equipment. When installing a new battery, be sure to remove any plastic battery terminal protectors before attaching wires.

Maintenance

All Exide marine batteries, except AGM types, have removable vent caps so that electrolyte levels can be checked regularly. You should check the electrolyte level every month. When storing a battery for the winter, check and fill with distilled water as needed, recharge the battery **fully**, and store in a cool place. When preparing the battery after winter storage, recharge the battery to its full charge state.

Selecting the Proper Exide Battery

Exide manufactures a complete line of batteries for all marine applications. From personal watercraft to mega yachts, Exide has a battery for your needs.

Marine Starting Batteries

Marine starting batteries have been designed to deliver high bursts of power for short periods of time, to start marine engines. The power level you need depends on the cranking requirements of your engine. Marine starting batteries are not designed to provide trolling or deep cycle power, which requires plates built to different specifications.



Engine HP	MCA Rating	EXIDE Model #
0-60	525	24MS
60-130	525	24MS
130-180	650	24MSX
	850	FP-AGM24MS
180+	1000	24MSXX
	1000	27MSXX

Dual Purpose Batteries

Exide manufactures a line of dual purpose batteries which combine deep cycle capability with starting power. They deliver enough power to start a 350-hp engine and provide at least 7 hours of continuous 10 amp 12-volt draw.



EXIDE Model #	MCA Rating	RC Rating	Amp Hour Rating
PL-AGM27M	930	190	90
FP-AGM24DP	930	145	75
XMC-31	1110	200	100
MC-31	840	200	100
24MDP	625	120	70
27MDP	730	160	100

Deep Cycle Batteries

Deep cycle batteries incorporate thicker grids, denser active material on the plates and alloys specifically designed to provide many cycles. These batteries are designed to provide continuous operating time to run trolling motors, live wells, inverters, 12-volt lighting, depth finders, etc. They can be charged and recharged many times without damaging the internal components of the battery. These batteries have a lower MCA rating and higher reserve capacity/amp hour rating than dual purpose or starting types.



EXIDE Model #	MCA Rating	RC Rating	Amp Hour Rating
24MDC	500	140	80
27MDC	675	182	105
31MDC	830	205	115
4DMDC	850	250	160
8DMDC	1200	400	200

It's Time To Replace Your Battery When...

- You had to jump start your battery
- The battery can barely turn the starter over
- Lighting and electronics dim or go out when starting
- The battery will not hold a charge
- The battery becomes submerged
- The battery discharges frequently between use
- You buy a used boat



POWERING THE
WORLD **FORWARD**



Exide uses a comprehensive business approach to recycling called Total Battery Management (TBM)[™]. TBM includes manufacturing and distribution of lead-acid batteries, collection of spent batteries, reclamation of battery materials and use of those materials in new batteries.

Exide Technologies recycles sufficient lead tonnage to make the Company one of the largest secondary lead recyclers in the world, returning the materials to new product and diverting them from the waste stream. Exide Technologies batteries are recyclable.

For more information and nationwide warranty terms visit us at exide.com or call **1-800-START-IT**